Research Note

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WESTERN LARCH AND DOUGLAS-FIR SEED DISPERSAL INTO CLEARCUTTINGS

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Knowledge of seed dispersal beyond the timber edge is basic to planning for natural regeneration in clearcuttings. Seed studies during 1952 on a clearcutting test on the Coram Experimental Forest in northwestern Montana provide dispersal information for western larch (Larix occidentalis Nutt.) and Douglas-fir (Pseudotsuga menziesii var. glauca (Beissn.) Franco).

The clearcuttings of 15, 30, and 60 acres are located in an overmature stand on north-facing slopes in an area frequented by westerly winds. The surrounding uncut timber averages 20 M bd. ft. per acre of which 75 percent is western larch, 20 percent Douglas-fir and the remainder Engelmann spruce and alpine fir. Larch trees average 130 feet in height and Douglas-fir 100 feet.

Seeds were counted in traps placed at regular intervals along two lines located crosswise in each square cutting unit and extending into the uncut reserve timber. The lines cross at the center of the block (bisecting opposite sides) and run from northwest to southeast and from northeast to southwest. This design made it possible to sample the dispersal from each side of the clear-cut blocks. Prior to seed ripening, all unmerchantable and small trees within the cut-over areas were felled to eliminate seed from that source.

RESULTS

The quantity of seed that fell to the ground decreased rapidly from the timber edge up to about four chains for Douglas-fir and six chains for larch (figure 1). Beyond these distances the quantity remained fairly constant at a low level to the farthest sampling point 12 chains (792 feet) from the source. An average of only 5,227 Douglas-fir seeds and 15,682 larch seeds per acre were scattered beyond the four- and six-chain distances, respectively. These average quantities are only three percent of the Douglas-fir and five percent of the larch seed dispersed in the uncut timber during the excellent 1952 seed year.

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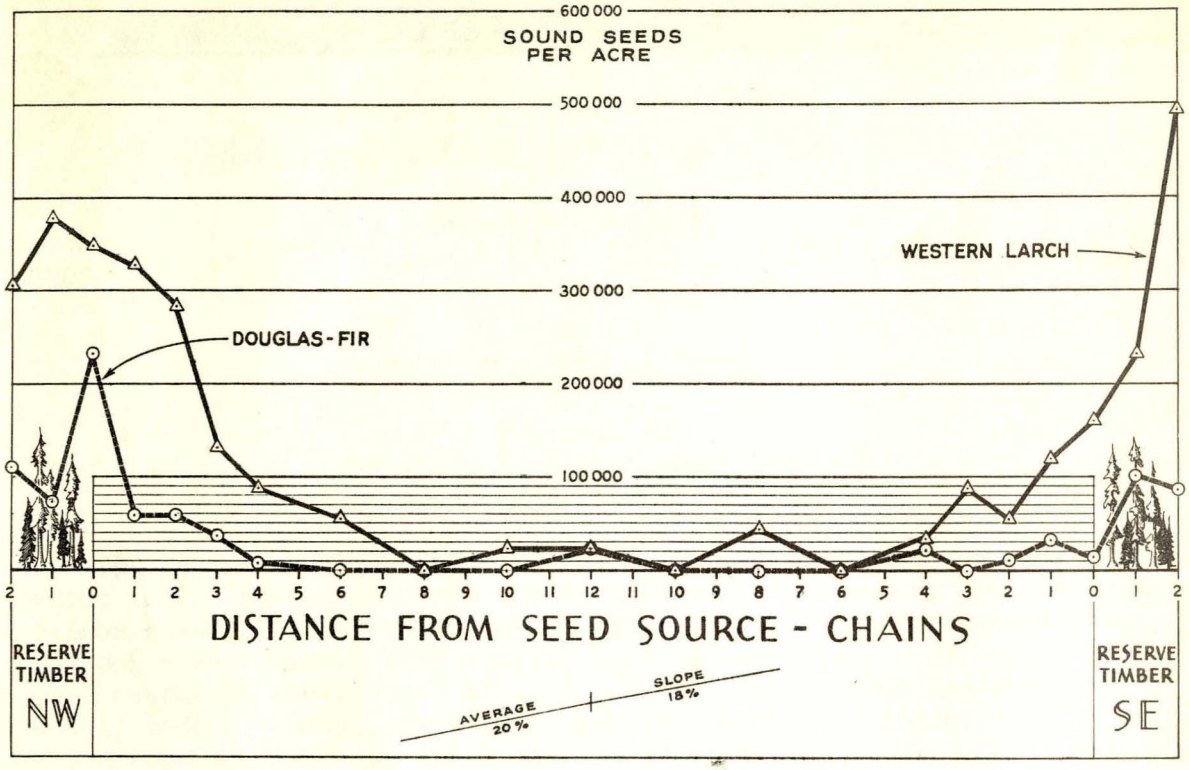
The greatest quantities of larch seed were dispersed from the westerly sides of the cuttings (figure 1). The amount scattered from the northwest (downhill) side was significantly greater than from the northeast (downhill) and southeast (uphill) sides and exceeded that from the southwest (uphill) side. The dispersal pattern for Douglas-fir was similar to that for larch.

DISCUSSION

Ordinarily one good seed crop maturing during the regeneration period will provide ample seed up to 6 chains (3 tree heights) from the timber edge for western larch and 4 chains (2.5 tree heights) for Douglas-fir. Beyond these distances and up to 12 chains from the seed source, the quantity of seed may not be sufficient for successful regeneration if ratios of from 50 to 100 sound seeds per established seedling (considered reasonable for partial cuttings) are found to apply in clearcuttings. Actually, seed from more than one crop will be dispersed during a regeneration period, although it is likely that only one or two good seed crops will mature while the seedbeds remain in optimum condition. Therefore, in clearcuttings where the seed must be supplied by the surrounding timber, areas beyond 6 chains may not receive enough seed during the first few critical years.

Prevailing westerly winds undoubtedly have caused most seed to be scattered from the westerly sides of the cuttings. Probably upslope thermal winds during dry, warm days combined with the prevailing winds to carry the greatest quantities from the northwest (downhill) side. This dispersal pattern may not hold where exposure, topography, and prevailing winds differ greatly from conditions on these cuttings.



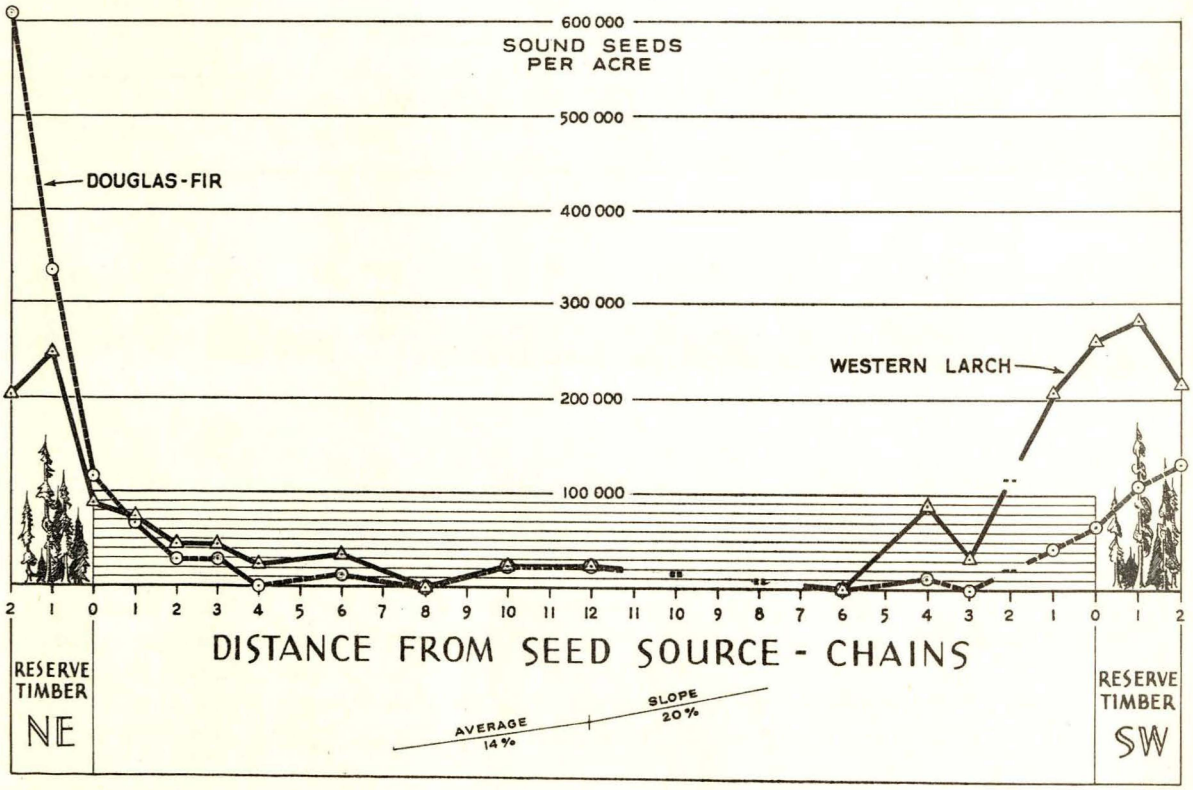


Figure 1. Quantity and dispersal pattern of the 1952 seed crop on Coram Experimental Forest clearcuttings